# CHAPTER 5: COMMUNICATIONS

## 5.1  THE JMCIS NETWORK

A TAC-3/4, Sparc 10/20, or RSC Gray Box loaded with the JMCIS software can be a standalone machine or networked in a server-client relationship.

### *Standalone*

A standalone machine is its own server. It retains data without relying on a networked server. It shares data through messages transmitted over configured comms ports, or by floppy disk or tape.

### *Network*

The communications processor (often called the CP, server, or jots1) holds all track and comms data. When installing software, the CP should be installed first, followed by its client machines. Client machines are dependent on the server for data, especially data from the track database. CP functions include:

- Processing incoming and outgoing messages.
- Decoding incoming messages.
- Correlating track information.
- Routing outgoing messages.

If the server goes down, the Track Database Manager (Tdbm) warning window informs the user that the server is down. Though the user can view track information, no track database actions (local or shared) are processed.

Workstations running different versions of JMCIS software (2.1.2.1 and above) can exchange track data using:

- GENBROADCAST segment
- MDX interface (described in *Comms* chapter of the *UB User's Guide*)

## 5.2  INTERFACE DESCRIPTION

JMCIS supports two interface types– serial and LAN.

### 5.2.1 SERIAL INTERFACE: RS-232, RS 422, MIL-188

Used for serial communication between JMCIS and another system (such as POST).

- If at the same site, connect them directly.

- If at different sites, connect them through a secure modem, such as a STU III.

Refer to *C3 MIL-188/RS-422/RS-232 Interface Converter Technical Description*, C3 Incorporated, Herndon, Virginia, for DIP switch settings for each interface.

### 5.2.2 LAN INTERFACE: ETHERNET AND FIBER OPTIC CABLING

Used for communications between two or more JMCIS workstations on a LAN.

- Each machine is assigned a unique name and address on the network.

- These are used by system files.

### 5.2.3 PROTOCOLS

#### TCP/IP

Transmission Control Protocol (TCP) moves data in a continuous, unstructured byte stream. It provides full-duplex service, acknowledgment of data received, and data flow control.

Internet Protocol (IP) provides network layer services to the TCP/IP protocol suite. IP is responsible for forwarding packets through a network based on IP addresses. IP relies on TCP to guarantee delivery of packets.

#### X.25

Used for a Wide Area Network (WAN) of computers connected by a Packet Switching Network (PSN), such as the Defense Data Network "DSNET1." (Generally used by ashore sites only.)

## 5.3  PHYSICAL CONNECTIONS

### 5.3.1  SERIAL

#### *Requirements for a Direct Connection*

A 2-, 3-, and 7-pin connection is required to connect JMCIS and other systems, such

as POST, located in the same installation.

### *Requirements for STU III Connection*

The STU III must support an RS-232 connection. If not, request an RS-449-to-RS-232 adapter from the manufacturer.

A TAC-3/4 requires:

- A DB 9 female-to-DB 25 male cable.

- Certain models of STU III require voltage on pins 4 and 20, which the TAC-3/4 does not supply. A special adapter must be used.

An RSC Gray Box requires:

- A DB 25 male-to-male cable.

### 5.3.2   LAN

### *Requirements for an Ethernet Connection*

- Use an AUI interface with a DB 15-pin connector between the workstation and the transceiver.

- The copper LAN interface may have a BNC connection between transceivers.

- The network must be terminated at both ends.

    - Use a terminating 50Ь resistor on each end.

- If the workstation is a standalone configuration, the LAN connections on the workstation must be terminated.

    - Use a 50Ь resistor on each.

### *Requirements for a Fiber Optic Connection*

- Use an AUI interface with a DB 15-pin connector between the workstation and the transceiver (Fibercom box).

- Fibercom boxes (nodes) must reside at each computer connected by fiber optics.

    These boxes have dual-ring capability to ensure continued transmission.

    For example, if a transmission is interrupted by a broken fiber optic or connection, it is automatically routed to the second ring.

### 5.3.3 X.25

#### *Requirements for an X.25 Connection (TAC-3/4)*

- If the system is configured for DDN communications, the Serial A port must be the DDN/X.25 interface device. No other device may be configured to the TTYA port.

- A DB 15 connects the machine to a modem and encryption device with an X.25 interface.

- The X.25 card provides synchronous RS-232 (DTE) error-free transmission over the PSN.

- There may be many interfaces, such as crypto, modem, or leased line, between the computer and the actual PSN.

## 5.4 COMMUNICATION AND BROADCAST CONFIGURATION

To configure a communications channel, use the COMMUNICATIONS option (described in the *UB User's Guide, Comms* chapter.)

Modify fields to configure the channel. Keep in mind the following general information:

- It is best to use standard comms settings– changing some settings, such as baud rate, parity, or stop bits, could cause data to be garbled.

  For example, if messages are garbled, it's likely that the transmitting and receiving sites don't have the same values set for the baud rate and related fields.

- XON/XOFF should never be used for baudot data connections.

  Toggle on the XON/XOFF checkbox support the use of the XON/XOFF commands to stop and resume transmission.

- If the RTS/CTS checkbox is toggled on, a Request to Send (RTS) message will be sent before the real message is sent.

  The recipient will reply with a Clear to Send (CTS) message when it's prepared to receive the data.

These channels are installed as the master default list of comms channels.

| *TTY DEVICE* | *ASSIGNED TO* |
|---|---|
| A | Printer |
| B | TRE/TRETABULAR |
| C | GFCP/Terminal Control |
| C0 | Link-11 (PED, PIH) |
| C1 | OTCIXS-TTY |
| C2 | OTCIXS |
| C3 | TADIXS |
| C4 | Ownship NAV Interface |
| C5 | Link-14 |
| C6 | HIT-BCST |
| C7 | FLT-BCST-1 |
| D | GENSERPOST |
| D0 | (none) |
| D1 | TADIXS TTY |
| D2 | DTC |
| D3 | Remote Link-11 (future) |
| D4 | Remote Link-11 RXA (future) |
| D5 | Remote Link-11 RXB (future) |
| D6 | FLT-BCST-2 |
| D7 | (none) |
| NTDS0 | ACDS |
| | Link-16 (optional) |
| | 2-way Link-11 |
| | WRN-6 |
| | WSN-5 |
| | SDMS |

### *Important:*

- Device *A* is not assigned to a comms channel. It is assigned to the printer.

- C*n* and D*n* channel assignments are valid only when 8-port MUX boards are used.

- NTDS*n* channel assignments are valid only when NTDS boards are used.

If settings have been modified (device settings, protocol parameters, or both) it is possible to return to the original system defaults, but pay attention to the following:

- Information pertaining to any new channels is removed. The current list can be saved to recall later.

- To save the current settings:

    1. Select DEFAULTS from the COMMUNICATIONS window pop-up menu to open the DEFAULTS window.

    2. Enter a name in the SAVED NAME field and click SET.

- To recall these settings:

    1. Open the DEFAULTS window.

    2. Highlight the name assigned to the saved settings and click GET.

    3. The system stops and restarts all channels.

- To reset channels to the original system defaults, select MASTER DEFAULT from the COMMUNICATIONS window pop-up menu.

    The system stops and restarts all channels.

    Remember, incoming messages could be lost during the time it takes to accomplish this task (approximately 1–2 minutes).

### 5.4.1  STARTING COMMS CHANNELS

A comms channel must be turned on before it can be used. Comms channels are turned on and off with the COMMUNICATIONS option from the COMMS pull-down menu.



| NAME | XRF | INT | INTERFACE | MACHINE | DEVICE | STARTUP | STATUS |
|------|-----|-----|-----------|---------|--------|---------|--------|
| LINK11-IH | LIH | EXT | LINK11IH | JOTS1 | TTYC0 | AUTO | ON |
| LINK11-EDO | LED | EXT | LINK11EDO | JOTS1 | TTYC0 | MANUAL | OFF |
| OTCIXS | OTC | EXT | OTCIXS | JOTS1 | TTYB | AUTO | ON |
| DTC | DTC | EXT | SERIAL | JOTS1 | TTYC2 | AUTO | ON |

ADD     EDIT     DELETE     EXIT

*Figure 5-1  Communications Window*

Channels are turned on and off one of two ways:

- Highlight the channel; select START, STOP, or RESTART from the pop-up menu.

- Toggle the AUTOSTART checkbox ON, in the COMMS EDIT window. This turns a channel ON at system startup.
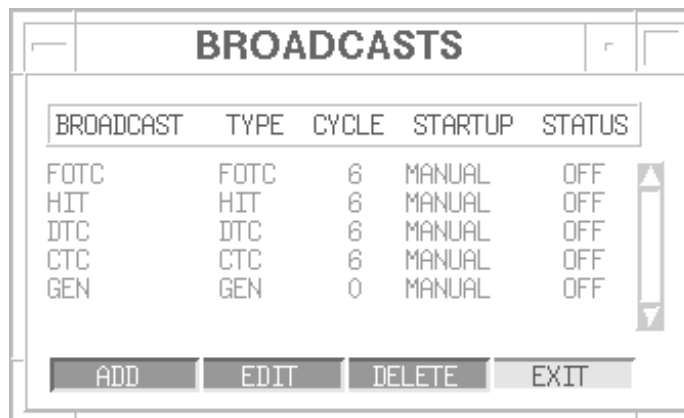
The STATUS column indicates status of each channel: ON or OFF.

***Important:***

- A comms channel can only be turned on if the designated device exists.

    For example, the DTC comms channel in Figure 5-1 is assigned to TTYC2. If a multiplexer is not connected to the TTYC port, this channel can't be turned on, but it can be reassigned to an existing port.

- A channel must be ON to open its status window.

    Highlight the channel.

    Select the WINDOW pop-up option.

### 5.4.2  STARTING BROADCASTS

A broadcast must be turned on before it can be used. Broadcasts are turned on and off using the BROADCASTS option from the FOTC/BCST menu. The BROADCASTS window displays a list of available broadcasts.



*Figure 5-2  Broadcasts Window*

Broadcasts are turned on and off one of two ways:

- Highlight the broadcast; select START from the pop-up menu.
- Toggle the AUTOSTART checkbox ON in the BROADCAST EDIT window. This turns the broadcast at system startup.

The STATUS column indicates status of each broadcast: ON or OFF.

### 5.4.3  MESSAGE TRANSMISSION

Messages are sent manually (using an XMIT option) and automatically (using a broadcast).

To transmit, make sure:

- The communications channel is turned on.
- The channel is configured properly.
- The channel can transmit messages.

Note: Manual transmissions are not allowed on the DTC channel; only automatic transmissions via the DTC broadcast.

To broadcast, make sure:

- The appropriate comms channels are running, as described in the previous section.
- The appropriate broadcast programs are running, as described below.

### 5.4.4  MESSAGE AND BROADCAST HEADERS

To set a default message header for manual transmissions, click DEFAULT in the HEADER EDIT window pop-up menu. This header is used for all options with a manual transmit capability, such as tracks and overlays.

Each broadcast has its own header. If DEFAULT is selected while creating a header for a broadcast, the broadcast header becomes the default message header. This header is used for manual transmissions *and* for the broadcast.

## 5.5  STU III CONFIGURATION

Keep in mind the following information when configuring a STU III.

- A serial interface comms channel must first be configured for the STU III connection (see also *Physical Connections*):
    - Set the device to the port connected to the STU III.
    - Use serial interface defaults for the other settings: data type=ASCII, parity=NONE, stop bit=1, baud rate=2400, data size=8, RECV and XMIT=ON.
- An entry must be made in the Auto-Forward Table. (See *Auto-Forward Table* in the *Unified Build User's Guide.*)

- An entry must be made in the Sources reference table if in FOTC mode. (See *Source XREF Table* in the *Unified Build User's* Guide.)

- Both STU IIIs must be in Remote Control Mode with Secure Access Control System (SACS) enabled.

- Both STU IIIs must have proper ACLs loaded.

- STU IIIs with SACS support auto-answer auto-secure– no operators are needed. In this mode, Voice/Secure Voice options are unavailable.

    - SACS grants access to designated STU IIIs, as identified in the ACL on the local STU III.

    - Three requirements for secure authentication of automatic, incoming calls are: ACL header, DAO code, and Keyset ID.

    - STU IIIs (including STU III SACS) without these codes are excluded, and cannot gain access or connect with STU-IIIs that share DAO codes or keyset IDs.

    - This creates a closed network. Unauthorized calls are disconnected before the line to JMCIS is opened.

- If two STU IIIs can talk to each other, but can't transmit data, their internal modes may be different. Check baud rates: synchronous and asynchronous must match.

## 5.5.1 PROCEDURES

### *Download ACL*

The following tables illustrate the sequence of a JMCIS ACL download. This sequence has been tested on AT&T devices only.

1. Insert the Master CIK.
2. Press MENU.

| OBSERVE | PRESS |
|---|---|
| Main Menu Secure Voice | NEXT |
| Main Menu Secure Data | NEXT |
| Main Menu Show Config | NEXT |
| Main Menu Change Config | SELECT |
| Change Config Security Config | SELECT |
| Security Config SACS Disable | NEXT |
| Security Config SACS Options | SELECT |
| SACS Options SACS Control | NEXT |
| SACS Options Auto Access Control | NEXT |

| | |
|---|---|
| SACS Options Far-end ID | NEXT |
| SACS Options Access List | SELECT |
| ACCESS LIST MENU Load ACL Via DTE | SELECT |
| WAITING FOR ACL start DTE transfer | (begin download) |
| RECEIVING ACL please wait | (wait until finished) |
| ACL RECEIVED nnn show new ACL | NEXT |
| ACL RECEIVED nnn save new ACL | SELECT |
| NEW ACL SAVED previous menu | MENU |

## *Temporarily disabling SACS ACL*

1.  Insert the Master CIK.

2.  Press MENU.

| OBSERVE | PRESS |
|---|---|
| Main Menu Secure Voice | NEXT |
| Main Menu Secure Data | NEXT |
| Main Menu Show Config | NEXT |
| Main Menu Change Config | SELECT |
| Change Config Security Config | SELECT |
| Security Config SACS Disable | SELECT |
| SACS Disable on/off change Disable | SELECT |

## *Autodialing Between Two AT&T STU IIIs*

1.  Insert the Master CIK.

2.  Press MENU to turn auto-answer on.

    -   After the ACL is downloaded, but *before* it is put in Remote Control Mode, auto-answer must be on.

    -   If the display indicates one or more AASD rings, auto-answer is on.

| PRESS | PRESS |
|---|---|
| NEXT until "Change Config" | SELECT |
| NEXT until "Security Config" | SELECT |
| NEXT until "SAC Options" | SELECT |
| NEXT until "SACS Control" (Ensure SASCTRL is enabled.) | SELECT |

| PRESS | PRESS |
|---|---|
| MENU | MENU (again) |
| NEXT until "Change Config" | SELECT |

| NEXT until "Security Config" | SELECT |
|---|---|
| The display panel will read SACS Disable (Ensure SACS Disable is OFF.) | SELECT |

| *PRESS* | *BUTTON* |
|---|---|
| MENU | MENU (again) |
| NEXT until "Change Config" | SELECT |
| NEXT until "Security Config" | SELECT |
| NEXT until "SACS Options" | SELECT |
| NEXT until "Auto Access Ctrl" | (Ensure Auto Access Ctrl is ON.) |

| *PRESS* | *BUTTON* |
|---|---|
| MENU | MENU (again) |
| NEXT until "Change Config" | SELECT |
| NEXT until "Auto-Answer" | SELECT |

## 5.5.2 CONFIGURING SPECIFIC STU-III MODELS

### *Motorola SECTEL 1000/2000:*

- This device provides the auto-secure feature, but does not allow auto-answer, nor does it support SACS.

- The default data mode is 2400 baud, asynchronous.

- An RS-232 port is included, allowing direct connection to JMCIS.

- A serial communications interface must be used.

### *RCA STU III:*

- The STU III data port is an RS-232 (DB 25) or an RS-449 (DB 37) connection, depending on manufacturer and model.

- RS-232 and RS-449 share the same signal levels but have a different pinout.

- RS-449 ports must be converted to RS-232 to work with JMCIS. These converters are included with the STU III.

The following table illustrates the conversion requirements of a STU III RS-449 configuration to an RS-232.

| RS-449 (STU-III) | RS-232 (TDP) |
|---|---|

| | |
|---|---|
| 1–Shield | 1–Shield |
| 4–Send Data (+) | 2–TXD |
| 6–Receive Data | 3–RXD |
| 7–Request to Send | 4–RTS |
| 9–Clear to Send | 5–CTS |
| 11–Data Mode | 6–DSR |
| 19–Common Return | 7–Common |
| 20–Receive Common | |
| 22–Send Data (-) | |
| 37–Send Common | |
| 12–Terminal Ready | 20–DTR |

*To configure an RCA STU III:*

1. Press PROGRAM.

2. Press SETUP.

3. Press YES at "set terminal options."

4. Press YES at "set standard options." The standard settings are:

   - Dialing mode: TONE

   - Comm mode: FULL DUPLEX

   - Data Ports: 2400 ASYNC

   - Remote Capable: DISABLED

   - A-lead Control: ENABLED

   - Dual Home: Line 1 only

## 5.6 TROUBLESHOOTING COMMUNICATIONS PROBLEMS

If messages are not being received or transmitted, the problem may be solved by checking the following hardware and software components. Correcting every communications problem is beyond the scope of this document, however some common trouble areas include:

- Connections between communications hardware and the workstation running JMCIS are established incorrectly.

- External communications devices are set incorrectly.

- Options that affect communications within JMCIS are set incorrectly.

NOTE: Within this section, "COMMS MENU" refers to the menu on the JMCIS screen, *not* the System Administrator screen.

### 5.6.1   HARDWARE PROBLEMS

Check the following:

- Communications antennas must be positioned to the proper azimuth.

- Radios must be up and running, with everything set correctly.

- Modems must be running properly.

- Cryptologic devices must be loaded and set correctly.

- Devices connected to JMCIS (for example, the (V)6) must be operational and set correctly.

- Connections must be tight.

- Check data converters.

- If the connection is serial, test the line with a breakout box.

    - Connect the breakout box to the machine, then to the comms line.

    - Verify signals are being provided by both sides without conflict. For example, the machine and the comms line could both have a signal on pin 2.

- If a properly configured comms channel is connected directly to a crypto/radio, and data results, check for an improper crypto hardware or crypto key.


### 5.6.2   SOFTWARE PROBLEMS

Check the following:

- Comms channels must be running. Otherwise, incoming messages could be lost and outgoing message could overload the buffer.

- Use incoming message logs and outgoing message logs to verify that messages are entering and leaving the system.

    Messages that have not been transmitted display as dots in the MSG TOT field (outgoing message logs).

- Comms channel parameters must be set correctly.

    - The machine associated with the comms channel in JMCIS must be the same machine to which the channel is connected.

    - The port (device) listed for the comms channel must be the same port to which it is connected.

- If messages are garbled, check the comms channel parameters such as baud rate, stop bits, etc.

- If messages are received but tracks are not displayed, check:

    - INPUT MSG FILTERS

    - INPUT GEO FILTERS

    - FOTC PARAMETERS (FOTC/BCST menu)

    - Applicable options in the PLOT CONTROL menu

- If the channel is a serial interface, toggle on the CRYPTO PHASE checkbox to make sure messages are handled properly.

    This checkbox is available for systems using the KG-84 encryption device (usually operating at 75 baud).

### 5.6.3   SPECIFIC CHANNELS AND INTERFACES

Troubleshooting suggestions for the following channels are addressed in this section:

- OTCIXS (including (V)6 and message backlog)
- OTCIXS-TTY
- Link-11
- DTC
- Low Data Rate(LDR)

    - HIT-BCST

    - Link-14

- Ownship/Navigation
- MDX

### OTCIXS

To check the status of the OTCIXS channel, or to correct communications problems, follow these steps until the problem is solved. While troubleshooting an OTCIXS problem, *turn off the OTCIXS broadcast to prevent a message backlog!*

1.   Review the information in the OTCIXS STATUS window.

    - Select COMMUNICATIONS from the COMMS menu.

    - Highlight the OTCIXS channel.

    - Select WINDOW from the pop-up menu to access the OTCIXS STATUS window.

2.   Troubleshoot the JMCIS (V)6 interface (described below in *JMCIS (V)6 and*

*Message Backlog*).

3.  Check that the General Front-end Comms Processor (GFCP) is turned on and functioning properly, if necessary.

*JMCIS/(V)6*

If the INTERFACE STATE field in the OTCIXS STATUS window reads DOWN, check the (V)6 to see if it's online. If so, initialize it again to reestablish the "handshaking" interface.

If the INTERFACE STATE field does not read DOWN, but messages are not being received or sent, follow these steps until the problem is corrected:

1.  Check the NET field. It should display OTCIXS/TADIXS.

    -   If it reads FLTSAT VOICE 1 or 2, then the (V)6 is set incorrectly.

    -   Correct the (V)6 settings, then reinitialize.

2.  Check the NET STATUS field to see if it reads NO NET CONTROL. This indicates one of four problems:

    -   radio

    -   satellite antenna

    -   crypto

    -   loose connection

3.  Run a Satellite Loop (SAT Loop) Test on the (V)6. If this test fails, it means the (V)6 is not communicating with the satellite.

    -   Check the communication paths, frequency, W3 status, and the position of the satellite antenna.

    -   SAT Loop may fail several times if the net is busy.

4.  Run a Crypto Loop Test on the (V)6. If this test fails, check the encrypting device to see if it needs reloading.

    This test does not validate "correct" crypto keylist or keylist day.

5.  Stop the OTCIXS comms channel.

6.  Restart the OTCIXS comms channel.

7.  Reinitialize the (V)6.

*Message Backlog*

The (V)6 queue holds a maximum of 50 messages. When the queue is full, an alert notifies the user, but only if alerts have been turned on. (See the *Unified Build User's Guide* for information on setting alerts.) An alert usually indicates that a hardware problem is causing the backlog.

Remember: If the (V)6 buffer is full, messages can backlog in the JMCIS outgoing queue even though there is no problem between JMCIS and the (V)6.

Check the following:

-   Confirm the backlog in the OUTGOING MESSAGE LOG window.

    -   Messages not sent to the (V)6 from JMCIS appear as dots in V6# field.

- Messages sent from JMCIS to the (V)6, but *not* sent from the (V)6, appear with a message number in the V6# field, an "X" in the S column, and dots in the MSG TOT field.

- If backlog is confirmed, turn off the OTCIXS interface until the source of the backlog is determined.

• Delete messages to clear backlog.

- Messages that will be timelate can be deleted, then retransmitted when the problem is corrected– delete in the OUTGOING MESSAGE LOG *and* the (V)6.

- Messages not sent to (V)6– delete in the OUTGOING MESSAGE LOG WINDOW.

- Messages sent from JMCIS but not sent from the (V)6– delete in the OUTGOING MESSAGE LOG *and* the (V)6.

• Verify that OTCIXS messages are being received.

• Check the NET CONTROL TIME field.

During periods of heavy use, outgoing messages "stack up" in the (V)6 transmit buffer. The accumulated NO NET time could affect how long it takes for the site to "catch up" when the net controller comes back online.

• Make sure the EMCON status is off in the (V)6. Otherwise, messages can't be sent.


**OTCIXS-TTY Channel**

OTCIXS-TTY is an optional comms channel. The (V)6 TTY channel is usually connected from the ON-143(V)6 to the USQ 136 teletype. The teletype prints the information passed from the (V)6, and can generate messages for transmission over the OTCIXS/TADIXS net.

Actively transferring the (V)6 TTY connection from the teletype to JMCIS, or passively tapping into the receive side of the channel, ensures that the OTCIXS/TADIXS net status can be monitored from within JMCIS.

Information directed from the (V)6 to the teletype includes:

• RCV Guard List from the (V)6 control head

• NO NET CONTROL time

• SID number of the net controller

• Synchronized system (V)6 time

To access the OTCIXS-TTY STATUS window, select WINDOW from the pop-up menu.

Note: The DATA ACCOUNT PRINT option must be active before data can be received. This option is located in DATA LINK PAGE on the (V)6 control head.

## Link-11 Channel

JMCIS receives Link-11 data via a serial interface from an EDO box. (Though the EDO box also has an IEEE-488 interface, JMCIS uses only the serial.) Another alternative is an Indian Head serial interface.

The EDO box passively taps the transmit and receive side of Link-11. Link-11 can be run in one of three modes:

- NCS– the ship is the Link-11 controller
- PKT– the ship is a Link-11 picket unit
- RS– the ship is radio silent

JMCIS receives Link-11 data from all participating units (PUs), other than Ownship, if Link-11 and its related components are operational. These components include modem, crypto, radio, and antenna.

JMCIS receives Ownship Link-11 data under the following conditions:

- The Ownship NTDS must be operational.
- Link-11 must be in the NCS or PKT mode.

*JMCIS not receiving data from PUs:*
1. Contact the Track Supervisor or Tactical Information Controller (TIC) to verify that the Link-11 components are operational.

2. Check the error lights on the EDO box. If an error light is on, the EDO box is preventing the Link-11 data from reaching JMCIS.

3. Check the Link-11 comms channel in JMCIS. (For more information, see *Troubleshooting Software Problems*, described in this chapter.)

*JMCIS not receiving data from Ownship:*
1. Make sure the Ownship NTDS is operational.

2. Check the Link-11 control panel settings. Ownship Link-11 data will be received only if the unit is in NCS or PKT mode, *not* RS.

## DTC Channel

The DTC channel uses a SERIAL interface to support a direct connection between JMCIS and non-JMCIS tactical data processors.

Outgoing messages can be generated by manual transmission, broadcasts, or autoforwarding.

If data is not being sent or received, see *Troubleshooting Software Problems,* described in this chapter.

## Low Data Rate (LDR) Channels

Low data rate channels in JMCIS include:

- HIT-BCST
- Link-14

Since these are 75 baud channels, the radio room can switch the patch for an LDR line and attach it to a teletype. Output on the teletype confirms data is being received.

- For more information, see *Troubleshooting Software Problems,* described in this chapter.
- Information pertaining to specific LDR channels is listed below.

### HIT-BCST Channel

Please note that the KW-7 crypto is still in use at a few sites. Because of the phasing requirements of the KW-7, CRYPTO PHASE must be selected in the COMMS EDIT window.

- The KW-7/KG-84 sends a phase signal to synchronize with other KW-7/KG-84 units that may be listening. Once this is complete, data must be passed to maintain the signal.
- When the data has been passed, the sync signal "errors out" in the KW-7/KG-84 and is dropped. At this point, the frequency is empty.
- The next phase signal controls the net until *it* stops sending data and drops sync.

If CRYPTO PHASE is not selected, JMCIS *does not* send a series of characters to phase the crypto gear. Therefore, the header on the first message is destroyed during the phasing process.

*Link-14 Channel*

NATO-format Link-14 is supported by UB versions 2.0.10.1 and above, and by JMCIS versions 2.1.0 and above.

## Ownship/Navigation Channels

When updating the position of Ownship, information is passed to JMCIS from one of the following channels:

- SINS
- SRN-19
- SRN-25
- CVNS
- LORAN C
- MX200
- WSN-5
- WRN-6

Though each channel has a window for incoming raw data, this data may not be readable. However, any information in the window– readable or not– verifies that data *is* being received.

If it appears there is no incoming data, confirm the update interval of the navigation channel. Update intervals can be as long as 15 minutes. Use a short interval to test the system, then reset it when data is verified.

The active Ownship interface must be restarted when the NAV update interval is changed. Select RESTART in the  COMMUNICATIONS window pop-up menu.

## MDX

The MDX interface provides point-to-point data communications– specifically, transmitting track information from one designated site to another. (See EDIT MDX Window in the *UB User's Guide*  for details.)

If the interface is not transmitting data, check the following:

- MDX patch Version 5 is loaded.
- The channel is configured properly.
- The route has been established between sites.

- Exact site host names appear in the host table.

- The transmit and receive port designations do not conflict with existing TCP port numbers in the /etc/services file.

- The values for transmitting port at one site match the values for the receiving port at the other site.

### 5.6.4 BROADCASTS

To troubleshoot a particular broadcast:

- Open the status window for the broadcast. (Broadcast must be ON; use the WINDOW pop-up option.)

- Open the window for the outgoing comms channel.

- Compare message activity.

- Ensure the Commands in the "TO:" fields in the default header are the same as those listed in the Auto-Forward Table.

- When in FOTC mode (Controller or Participant), make sure the correct Receive Guard List in the ON-143(V)6 has been entered.

**Notes**

**Notes**

# CHAPTER 6:  ERROR RECOVERY

**Never power off the system without first executing a shutdown.** Doing so could cause irreparable damage. If the system has already been brought down incorrectly, refer to *Repairing File Systems,* described in this chapter.

The following topics are covered:

- Basic Error Recovery
- Performance Tips
- Troubleshooting Multi-Monitors
- Identifying Hardware Problems
- Repairing File Systems
- Reporting Problems

## 6.1  BASIC ERROR RECOVERY

When JMCIS doesn't function as expected, and the SYSTEM SERVICES window (MISC menu) indicates that all processes are running correctly, follow these steps until the problem is corrected.

Access to all System Administration menus and options is required for error recover procedures.

Important! The following procedures are listed according to "risk factor"– that is, from the least to the greatest risk of damaging files or losing data. *Always begin corrective action with the procedure that poses the least risk.*

If these steps don't correct the problem, contact the number listed in *To Report a Problem,* described in this chapter.

### *Options are unavailable:*

Access to options may be restricted for the user's account. Check with Security Manager.

### *Window hangs or menu option has been disabled:*

**Select** CLOSE ALL from the SYSTEM menu (on the main menu bar). All windows will be cleared from the screen.

***Comms interface doesn't work:***

1. Select COMMUNICATIONS from the COMMS menu.

2. Highlight the specific interface.

3. Choose RESTART from the pop-up menu.

For more information, see *Troubleshooting Comms Channels and Connections*, described in Chapter 5. )


***Map not functional or system prompts to "restart chart":***

1. Notify users on remote monitors that their maps will soon close.

2. Select RESTART CHART from the CHARTS menu.

3. Select SYSTEM CHART from the CHARTS menu if the chart doesn't reappear.


***Map functions hang:***

This process takes approximately 45 seconds and clears all display-oriented functions. The values for the map functions must be reentered when JMCIS starts.

1. Select CLEAN DATAFILES from DATABASE menu on the System Administration menu bar.

2. Select MAP TOGGLES (LOCAL).

3. Click OK.

4. Return to the JMCIS screen.

If the previous specific procedures do not solve the problem, perform the following:


***Restart the system:***

1. Select EXIT from the SYSTEM menu (on the main menu bar).

2. Click EXIT SYSTEM on the startup screen.

3. Restart with user login.

### *Reboot the system:*

1. Notify users on remote monitors that their maps will soon close.

2. Select REBOOT SYSTEM from the HARDWARE menu on the System Administration menu bar.

3. Restart JMCIS with user login.

### *Power up/down the system with pointer and keyboard operational:*

See Chapter 3, *Operating Guidelines.*

### *Power up/down the system with pointer frozen:*

1. Turn off the monitor and peripherals.

2. Turn off the CPU.

3. Wait approximately 30 seconds.

4. Turn on the monitor and peripherals.

5. Turn on the CPU.

6. Restart JMCIS with the user login.

### *Reinstall JMCIS:*

1. Use the original JMCIS installation tapes if a network installation is not possible.

2. Follow the instructions to reinstall the software. (See Chapter 4, *Software Installation.*)

## 6.2  PERFORMANCE TIPS

• Double-clicking or repeating commands does not hurry the process.

• When commands are repeated or clicked continually, the system logs them *each time,* thus delaying the process even further.

### *System is slow:*

• Activate required overlays only. If all overlays are activated, it slows the system's performance.

• Close INSET CHART (main menu bar) and use only the SYSTEM

CHART.

## 6.3  TROUBLESHOOTING MULTI-MONITORS

***Any monitor or keyboard fails to respond:***

- A reboot may solve the problem.

- Rebooting the computer in a multi-monitor environment means *all* monitors will go down. When working with multi-monitors, contact all users before rebooting.

***Monitor is black:***

- Make sure the monitor cable is properly connected.

- Make sure the monitor is connected to a power supply and is turned on.

- The video switch may have incorrect input or output, or may be turned off.

***Monitor is black with small yellow squares:***

- Make sure each monitor is connected to the correct port on the back of the CPU.

***Second monitor in a dual-eye configuration is gray:***

- Make sure keyboards are connected correctly. This monitor is the second eye of a dual-eye configuration. (See Chapter 2, *Dual-Eye Console.*)

***Trackball doesn't respond:***

- A reboot usually solves this problem. If it doesn't, try using a different trackball. If it still doesn't work, there may be a wiring problem in the cable.

***Keyboard doesn't respond:***

- Make sure the keyboard is connected properly.

- The keyboard may be connected properly but the monitor may not "echo" the typed characters to the screen. A reboot usually solves this problem, but can be difficult to perform since the user can't see what's being typed.

## 6.4  IDENTIFYING HARDWARE PROBLEMS

When the workstation is turned on, the CPU runs a hardware check.

If the hardware check is successful:

- The system boots the device at: SCSI address 0

- b sd(0,0,0) appears, indicating the boot of the primary disk.

- The system displays configuration information, followed by the login prompt.

If the boot fails, there's a disk problem. Refer to the hardware manual.

## 6.5  REPAIRING FILE SYSTEMS

If the system was brought down unexpectedly (power failure, turned off without proper shutdown, etc.), it's designed to repair the file system when powered up.

- The system should never be powered down while the file system is being repaired. This will cause further damage to the file system.

- If power is fluctuating, leave the system off until power is reestablished.

## 6.6  TO REPORT A PROBLEM

For immediate assistance, or to report a problem, call the 24-hour hotline at NISE East Det Norfolk:

> CONUS:    1-800-869-6413
>
> Overseas:  1-804-399-2762  (collect)

If a problem can't be corrected by the procedures described in this manual, follow these guidelines to report it:

1.  Make sure the problem can be repeated.

2.  Record:

    - the problem

    - the last steps leading to the problem

    - how often the problem occurs

3.  Describe attempts to solve the problem.

# **Notes**